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SOURCE Tung-pei Ching-chi Hsiao-ta'ung-shu, Vol XIII, 1947.

PAPER AND PULP INDUSTRY OF THE NORTHEAST, 1942 - 1945

Summary: This report on the paper and pulp industry is one of a series on economic conditions in the Northeast from the Tung-pei Ching-chi Hsiao-ta'ung-shu (Little Encyclopedia of the Northeast). During the 1940's, the Northeast manufactured enough paper to supply its own needs. The paper production for 1945 was 122,200 metric tons. In 1944, the Northeast imported 46,255 metric tons and exported 284,545 metric tons of paper. In 1945, there were 43 paper manufacturing companies and 55 pulp mills in the area. Paper mills in operation during 1945 are listed.

Kirin, Sungkiang, Antung, and Hokiang provinces produced 555,550,000 cubic feet of lumber. In 1945, pulp production capacity reached 126,000 metric tons. In 1944, about 11,006 metric tons of paper pulp produced in the Northeast were transported to north and central China. The best pulp-producing areas are listed.

I. PAPER

Paper Industry of the Northeast

In the 1940's, the Northeast area manufactured enough paper to supply its own needs. In 1945, there were 43 paper manufacturing companies and 55 pulp mills in the area. The capital invested was estimated to be 176 million yuan (puppet currency). The installation of manufacturing equipment included the completion of 82 paper manufacturing machines and partial completion of 12 paper manufacturing machines. Production totaled 122,200 metric tons of paper for 1945. The production capacity was estimated to be 176,000 metric tons of paper per year, if all machines were in full operation.

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The highest paper production year was 1943, and the production totaled 76,386.26 metric tons. The following list shows raw materials, chemicals, coal, and electric power consumed during 1943:

1. Actual Production

Smooth-finish paper (MT)	51,004.52
Cardboard (MT)	11,467.80
Japanese paper (MT)	<u>13,913.94</u>
Total	76,386.26

2. Items Used for Paper Manufacturing

Raw material (MT)		
Pulp	56,055.10	
Other types of raw material	<u>72,767.20</u>	
Total	128,822.30	
Chemicals (MT)	9,837.00	
Paper manufacturing equipment		
Metallic wire cloth 444 sheets (22,200 kilograms)		
Bottom felt 1,716 sheets		
Press felt 630 sheets		
Jacket felt 49 sheets		
Canvas 105 sheets		
		Total value, 128,154 English pounds
Coal (MT)	210,399.00	
Electric power (kw-h)	53,302.583	

The following is a list of paper manufacturing mills in operation during 1945:

First-Class Mills

Chin-chou Pulp Mill
 Manchuria Beanstalk Pulp Mill
 Kirin Mill
 Ying-ch'eng-tzu Mill
 Ch'ang-ch'un Mill
 East Manchuria Mill
 Ying-k'ou Mill
 Antung No 1 Mill
 Antung No 2 Mill
 Antung No 3 Mill
 Tung-yang Pulp Mill
 Manchuria Pulp Mill
 Manchuria Paper Works
 Manchuria Paper Manufacturing Company
 Manchuria Papermaking Company

Second-Class Mills

Wu-shun Paper Mill
 Kirin Paper Manufacturing Company
 Wan-san Paper Manufacturing Company
 Chao-jih Paper Manufacturing Company
 Manchuria Paper Industrial Company

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Japan-Manchuria Paper Manufacturing Company
 Hsieh-ho Paper Manufacturing Bureau
 Greater Manchuria Paper Manufacturing Company
 Sung-pu Paper Manufacturing Company

Third-Class Mills

Chao-kuo Paper Manufacturing Company
 Hsieh-ho Paper Mill
 Chien-tu Paper Mill
 Sung-shan Paper Manufacturing Company
 Asia Paper Mill
 Mukden Paper Mill
 Chin-chou Paper Mill
 Cathay Paper Mill
 Jih-ch'eng-t'ai Paper Mill
 Tung-chi Paper Mill
 Manchuria Paper Works
 I-shun Paper Manufacturing Company
 T'ung-i-yung Paper Manufacturing Company
 Jih-kuang Paper Manufacturing Company
 Fu-hsing Paper Manufacturing Company
 T'un-i Company
 P'an-shan Paper Manufacturing Company
 Chu-yeh Paper Manufacturing Company
 Lu-t'ang Paper Manufacturing Company
 Fu-hai Paper Manufacturing Company
 Hsing-ya Paper Manufacturing Company
 Manchuria Pulp Mill
 San-ho Pulp Mill
 Wan-shih Paper Manufacturing Company
 Manchuria Forest Products Company

Paper Supply and Mills of the Northeast

During 1944, the Northeast imported 46,266 metric tons of paper and exported 24,315 metric tons of smooth-finish paper and 260,230 metric tons of other grade papers. The exports totaled 284,545 metric tons.

In 1945, there were 43 paper manufacturing companies and 55 pulp mills in operation. The paper production of 1947 was only 40 percent of the 1945 production because of damage done before the Japanese surrender.

Future of the Northeast Paper Industry

Some of the future plans include the following: (1) investigate thoroughly the paper industry of the Northeast, (2) appoint a special government agency to handle this industry, (3) select mill sites carefully, (4) draw up production and supply plans, (5) plan the import of lumber, pulp, and chemicals, (6) plan the conservation and production of coal and electric power, and (7) plan to recruit technical personnel and experts.

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II. PULP

Pulp-Producing Provinces of the Northeast

The four Northeast provinces that produce timber for pulp are Kirin, Sungkiang, Antung, and Hokiang. These provinces produce 555,550,000 cubic feet of lumber; but because of the peculiarities of the Northeast region, only 70 percent of the lumber is useful. Each year 7,770,000 cubic feet of timber may be cut; but up to 1945, only 2,220,000 cubic feet of timber was cut each year. If the pulp resources of the Northeast are properly developed, they will provide enough paper for the entire continent of Asia.

More than 350 varieties of trees are produced in the Northeast. They may be divided into two types: (1) needle-leaf type, such as pines; and (2) broad-leaf type, such as elms, walnuts, willows, white birches, and others. Most of the needle-leaf type trees grow on the Greater Khingan Range. The broad-leaf type trees grow in Liaoning and Kirin provinces and on the Khingan Ranges.

Reeds and soybean stalks are used as substitutes for wood pulp. Over 70,000 metric tons of reeds are produced each year in the southwestern part of the Northeast. The northwestern area is undeveloped. The soybean stalk production is 5,500,000 metric tons yearly. There are approximately 600,000 metric tons of soybean stalks produced near the railroads.

According to the 1936 survey, the following is a breakdown on the lumber reserve of the Northeast area:

<u>Province</u>	<u>Needle-Leaf Trees (cu ft)</u>	<u>Broad-Leaf Trees (cu ft)</u>	<u>Total (cu ft)</u>
Nunkiang	126,008,000	295,527,000	421,535,000
Heilungkiang	52,315,000	207,138,000	259,453,000
Hokiang	36,209,000	95,900,000	132,109,000
Sungkiang	14,975,000	49,931,000	64,906,000
Kirin	852,207,000	815,223,000	1,668,430,000
Antung			
Liaoning			
Liaopeh			
Jehol			
Hsingan			
Total	1,081,714,000	1,464,719,000	2,546,433,000

By 1945, there were nine paper pulp mills (including five wood pulp mills, three reed and soybean stalk pulp mills, and one other pulp mill). Their total production capacity had reached 126,000 metric tons of pulp per year.

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During the Japanese occupation, a plan was drawn up for pulp production. The following is the estimated plan and the actual production during the years 1942 - 1945:

<u>Year</u>	<u>Estimated Plan</u>		<u>Actual Production</u>	
	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>
1942	121,700	100	95,155	80
1943	134,400	100	65,740	50
1944	168,100	100	58,901	35
1945*	177,800	100	7,805	4

(* From April to July only)

The decrease in production was due to the lack of raw material during those years.

The raw material used for the manufacturing of pulp were wood, reeds, beanstalk, coal (from the Northeast), sulfur, caustic soda, bleaching powder, chlorine, quicklime, alum, magnesium powder, soda powder, limestone, and metallic-wire cloth (from Japan).

Paper Pulp Supply

The production of paper pulp supply for 1943 was 66,744 metric tons, for 1944 it was 58,901 metric tons, and for 1945 it was 7,805 metric tons (from April to July). There was no import of paper pulp in the 1940's. In 1943, about 9,380 metric tons of paper pulp were shipped to north and central China. In 1944, about 11,006 metric tons of paper pulp were shipped to north and central China.

Future of Paper Pulp Industry

Before 1945, there were five wood pulp mills which produced 86,000 metric tons of pulp per year, three reed and beanstalk pulp mills which produced 40,000 metric tons, totaling 126,000 metric tons of pulp per year. The pulp production was sufficient to meet the needs of the Northeast and any excess production were sent to north and central China. However, at present, much of the equipment has been removed by the Soviet forces.

The present plan is to produce enough pulp for the entire country. Future plant sites must be considered in the light of their convenience to transportation, water power, and access to raw material.

One difficulty is that in the manufacturing of pulp soft water is required and the water of the Northeast area usually contains over 20 percent of magnesium or calcium. The transportation of raw material is difficult since a large quantity of trucks are necessary to move the timber, coal, limestone, sulfur, caustic soda, and chlorine.

According to a 1947 estimate, China needs approximately 500,000 metric tons of paper per year. Since the rest of China produced about 100,000 metric tons per year, the Northeast must produce 400,000 metric tons per year.

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The Khingan Ranges is considered the best territory for mill sites, since this area has vast forests and coal deposits. Other areas such as Chia-mu-ssu, Ai-hun, Ya-k'o-shih are being considered.

The best pulp-producing areas are:

1. Chia-mu-ssu -- Synthetic fiber pulp and crushed wood pulp (newsprint)
2. Ai-hun -- Sulfuric acid paper pulp
3. Basin of Tumen River -- Synthetic fiber pulp and sulfuric acid paper pulp
4. Shores of Ching-po Hu -- Crushed wood pulp (newsprint)
5. Kirin -- Crushed wood pulp
6. Mao-tan-chiang -- Synthetic fiber pulp and paper pulp

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